Understanding of Machinery Technology in Understanding Renewable Energy Towards Indonesia Go Green

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Abstract. There are 10 countries with the least pollutant levels in the world. This is what triggers the example of other countries. So it is necessary to explore what makes these countries superiors in environmental issues so that they are ranked in the top 10 on the world scales according to the U-Earth Team. However, a clean country can be due to a small area or a small population so that the pollutants become small. The method used for this research is a literature study with a qualitative research type based on what already exists. What is meant here is the research method with reference to the existing literature. The stages of this research are looking for problems, then collecting the existing literature. Then after that, examine the related parameters related to the problem. The final step are to find a solution to the existing problem. The importance of progress of going green in this great country so that it can save much human beings. You could say, in terms of SO_2, NOx and Dust emission levels in Indonesia, Indonesia has a fairly high ratio, so it is important to check CO_2 in every vehicle and industry as well as limit personal use. The essence of this research is that public education about go green energy and minimizing pollution is very much needed.

Keywords: Renewable Energy, New Energy, Environmentally Friendly Energy, Clean Energy, Less Pollution

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INTRODUCTION

Indonesia still needs consideration in green the environment because Indonesia needs a sustainability breakthrough in environmentally friendly clean energy management. Therefore these things are very little noticed by most people that have inhaled a lot of CO_2 because this carbonic acid is a pollutant and is not good to inhale too much. The following is a list of countries in the world with the least pollutant levels (Abbas, et al., 2020).

Table 1. List of Countries with the Lowest Pollutants (U-Earth Team, 2022)

No	Country	Emission Level (μg/m³)
1	New Caledonia	3,8
2	US Virgin Islands	4,5
3	Puerto Rico	4,8
4	Cape Verde	5,1
5	Bonaire, Sint Eustatius and Saba	5,1
6	Finland	5,5
7	Grenada	5,5
8	Bahamas	5,5
9	Australia	5,7
10	Estonia	5,9

Based on what has been described in table 1, there are 10 countries with the least pollutant levels in the world. This is what triggers the example of other countries. So it is necessary to explore what makes these countries superiors in environmental issues so that they are ranked in the top 10 on the world scales according to the U-Earth Team (Khoirudin, et al., 2021). However, a clean country could be due to a small area or a small population so that the pollutants are small. However, for most large countries, this can be based on technological innovation in the field of renewable energy. Indonesia is a large country with many islands so it is dubbed as an archipelagic country. With many islands, of course, there is a lot of mineral potential in it so this is a big

challenge for us as Indonesians. The following will describe the energy resources in Indonesia (Dewadi, Dahlan, & Maulana, 2019).

Table 2. Energy Capacity and Percentage of Energy Use (energypedia, 2022)

Source	Installed capacity (2015) *[MW]*	Share of energy generation (2025) *[%]*
Solar	773	
Wind	737	
Hydro	8,688	5%
Ocean	1	
Biomass	1,287	5%
Geothermal	3,516	5%
Total	15,002	17%

METHOD

The method used for this research is a literature study with a qualitative research type based on what already exists. What is meant here is the research method with reference to the existing literature. The stages of this research are looking for problems, then collecting the existing literature. Then after that, examine the related parameters related to the problem. The final step are to find solutions to existing problems. The following will explain the research flow in Figure 1 .

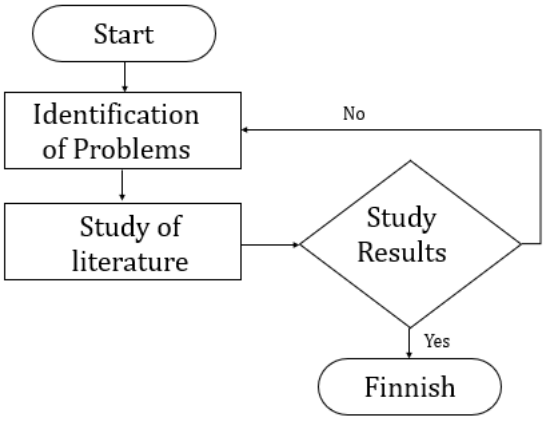

Figure 1. Research Methodology (Wibowo, Setiawan, Dewadi, & S, 2021)

RESULTS

There are a lot of natural resources related to renewable energy in Indonesia, although fossil energy reserves are quite adequate, but fossil energy should not be taken into account in this case because the role of fossil energy is only secondary (Wikipedia, 2022). The reason fossil energy must be taken into account is secondary, namely in the process of renewing its duration which has a short period of time (Wikipedia, 2022). However, in energy processing, the role of machinery technology is needed. Therefore, machining technology must be well understood. Fundamentally, it needs turbines and generators except for solar energy only (Extralink, 2022). For solar energy using solar cells as a medium for capturing the intensity of sunlight and then the

captured energy is stored in the battery (Abadi, 2022). In other renewable energy using a turbine as a driver which is forwarded to a generator. When it becomes electrical energy thanks to a generator, it is then channeled directly into the battery or through a transformer first (SIEMENS, 2022). The following will show the components in new renewable energy machinery technology in Figure 2.

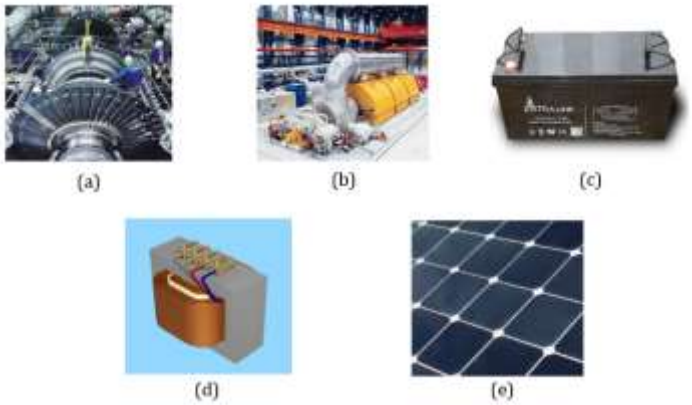

Figure 2. (a) Turbine, (b) Generator, (c) Battery, (d) Transformer, (e) Photovoltaic

Some things that need to be studied are the understanding of new and renewable energy at the basic level and the habit of saving electrical energy. The basic reason it must be at the elementary school level is so that children that are still fresh in terms of thinking tend to be able to make important breakthroughs (Sukarman, Dewadi, Supriyanto, Sunandar, & Karyadi, 2021).

Understanding of New Renewable Energy Machinery Technology at Elementary School Level

From what has been described in Figure 2, there are important components, one of which is a turbine. Turbine is a component that rotates around the pressure and velocity of the incoming fluid. This turbine is used in wind, water, geothermal, steam, nuclear energy sources and so on. The generator is a component in the science of energy conversion that tends to be integrated with the turbine (Karyadi, Nanda, Dewadi, Amir, & Rizkiyanto, 2022). The generator that is integrated with the turbine continues the rotation of the turbine and creates an electric force (electromagnetic force) Batteries are used to store electrical energy where a process of energy circulation becomes an output called electrical energy. Electrical energy is stored in the battery according to the battery capacity . The transformer is a device that functions to increase and decrease the current according to the function of the transformer and the type of transformer. The types of transformers generally consist of 2 types, namely step-up transformers and step-down transformers. The step-up transformer functions to increase the voltage while the step-down transformer functions to decrease the voltage. Next is solar cells or commonly called photovoltaic which functions to capture the intensity of sunlight which is converted into electrical energy (Raja Ma'arof, Saputra , Dewadi, & Noor, 2022).

Habituation to Save Electrical Energy

The habit of saving electrical energy is an important factor needed in reducing fossil energy. Fossil energy if allowed to continue in use, the other impact on the area will be polluted and unclean. In Indonesia, especially the use of fossil energy is still very high. Imagine if the waste of electrical energy where electricity from this country tends to use fossil energy sources, in general it is certainly not feasible and economically unsafe. In the selection of energy sources, alternative energy must be empowered as optimally as possible so that energy consumption is not excessive. If the energy consumption is excessive, then the battery reserve**s** as a reservoir **of** electrical energy will not be optimal in storage over time. Therefore it is necessary to change behavior in the consumption of electrical energy.

DISCUSSION

Based on what has been explained in the research results, what needs to be considered is sustainable energy, where sustainable energy is the main parameter in overcoming pollution in Indonesia. Indonesia as a densely populated country must pay more attention to the potentials that can cause pollution. Efforts that need to be taken into account is by limiting the use of private vehicles and checking CO_2 (emissions checks). This reason is because Indonesia needs to go green that is qualified as the potential for an archipelago and agricultural country. Agriculture in Indonesia is indeed abundant land so it is not a country with industrial distances and slum housing. The following is a graph of emissions which will be explained in Figure 3 version of Greenpeace.

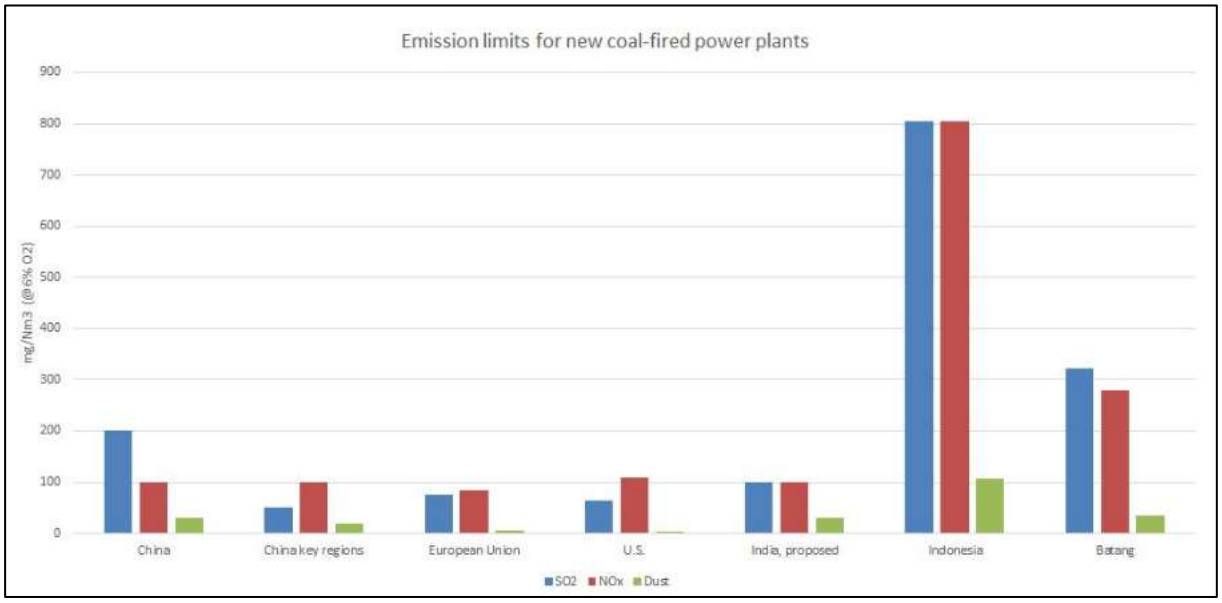

Figure 4. Global Emission Level (Boren, 2015)

CONCLUSION

The importance of the progress of going green in this great country so that it can save much human beings. You could say, in terms of SO_2, NOx and Dust emission levels in Indonesia, Indonesia has a fairly high ratio, so it is important to check CO_2 in every vehicle and industry as well as limit personal use. The essence of this research is that public education about go green energy and minimizing pollution is very much needed.

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